

**AMENDMENTS TO THE CLAIMS**

This listing of the claims replaces all prior listings and versions:

- 1 to 6. (canceled).
7. (currently amended): A polynucleotide encoding an immunologically effective detoxified fragment of an *E. coli* heat labile toxin (LT-A) polypeptide, wherein (i) said fragment comprises an amino acid sequence selected from the group consisting of SLRSAHLR, LRSAHLRG, RSAHLRGQ, SAHLRGQS, AHLRGQSI, HLRGQSIL, LRGQSILS, and RGQSILSG, ~~at least 8 contiguous amino acid residues of SEQ ID NO:1, wherein said at least 8 contiguous amino acids include a residue corresponding to Ala at is at least 8 amino acids in length;~~ (ii) ~~said fragment includes an amino acid residue at position 72, numbered relative to of SEQ ID NO:1;~~ and (iii) ~~said amino acid residue at position 72, numbered relative to SEQ ID NO:1, is an arginine residue.~~
8. (previously presented): The polynucleotide of claim 7 further comprising a sequence encoding a second immunogenic antigen.
9. (previously presented): The polynucleotide of claim 8 wherein the second immunogenic antigen comprises a subunit B of an *E. coli* heat labile toxin (LT-B).
10. (previously presented): The polynucleotide of claim 9, wherein the LT-A and LT-B are encoded in a polycistronic unit.
11. (previously presented): An expression vector comprising the polynucleotide of claim 7.
12. (previously presented): An expression vector comprising the polynucleotide of claim 8.
13. (previously presented): An expression vector comprising the polynucleotide of claim 9.
14. (previously presented): An expression vector comprising the polynucleotide of claim 10.
15. (previously presented): A host cell comprising the expression vector of claim 11.

16. (previously presented): A host cell comprising the expression vector of claim 12.
17. (previously presented): A host cell comprising the expression vector of claim 13.
18. (previously presented): A host cell comprising the expression vector of claim 14.
19. (previously presented): The host cell of claim 15, wherein the host cell is selected from the group consisting of a bacterium, a mammalian cell, a baculovirus, an insect cell and a yeast cell.
20. (previously presented): The host cell of claim 19, wherein the host cell is *E. coli*.
21. (previously presented): The host cell of claim 19, wherein the host cell is a mammalian cell.
22. (previously presented): The host cell of claim 19, wherein the host cell is an insect cell.
23. (previously presented): The host cell of claim 19, wherein the host cell is a yeast cell.
24. (previously presented): The host cell of claim 19, wherein the host cell produces the amino acid sequence intracellularly.
25. (previously presented): The host cell of claim 19, wherein the host cell secretes the amino acid sequence.
26. (previously presented): The *E. coli* host cell of claim 19, wherein the host cell is mutated to produce a phenotype lacking wild type LT-A.
27. (previously presented): A method of producing a recombinant protein comprising:
- (a) providing a population of host cells according to claim 15; and
  - (b) culturing said population of cells under conditions whereby the LT-A or fragment thereof encoded by the polynucleotide in said expression vector is expressed.

28. (previously presented): A method of producing a recombinant protein comprising:  
(a) providing a population of host cells according to claim 17; and  
(b) culturing said population of cells under conditions whereby the LT-A or fragment thereof and the LT-B encoded by the polynucleotide in said expression vector is expressed.

29. (previously presented): A method of producing a recombinant protein comprising:  
(a) providing a population of host cells according to claim 26; and  
(b) culturing said population of cells under conditions whereby the LT-A or fragment thereof encoded by the polynucleotide in said expression vector is expressed.

30. (withdrawn): A polynucleotide encoding an immunologically effective detoxified fragment of an *E. coli* heat labile toxin (LT-A) polypeptide, wherein (i) said fragment comprises an amino acid sequence selected from the group consisting of SLRSAHLR, LRSAHLRG, RSAHLRGQ, SAHLRGQS, AHLRGQSI, HLRGQSIL, LRGQSILS, and RGQSILSG. at least 8 contiguous amino acid residues of SEQ ID NO:2, wherein said at least 8 contiguous amino acids include a residue corresponding to Ala at is at least 8 amino acids in length; (ii) said fragment includes an amino acid residue at position 72, numbered relative to ~~of~~ SEQ ID NO:2; and (iii) said amino acid residue at position 72, numbered relative to SEQ ID NO:1, is an arginine residue.

31. (withdrawn): A polynucleotide encoding an immunologically effective detoxified fragment of an *E. coli* heat labile toxin (LT-A) polypeptide, wherein (i) said fragment comprises an amino acid sequence selected from the group consisting of TLROAHLR, LROAHLRG, ROAHLRGQ, QAHLRGQN, AHLRGQNI, HLRGQNIL, LRGQNILG, and RGQNILGS. at least 8 contiguous amino acid residues of SEQ ID NO:3, wherein said at least 8 contiguous amino acids include a residue corresponding to Ala at is at least 8 amino acids in length; (ii) said fragment includes an amino acid residue at position 72, numbered relative to ~~of~~ SEQ ID NO:3; and (iii) said amino acid residue at position 72, numbered relative to SEQ ID NO:1, is an arginine residue.

32. (withdrawn): A polynucleotide encoding an immunologically effective detoxified fragment of an *E. coli* heat labile toxin (LT-A) polypeptide, wherein (i) said fragment comprises an amino acid sequence selected from the group consisting of TLRQAHR, LROAHRG, ROAHRGQ, QAHRGQN, AHRGQNM, HFRGQNML, FRGQNMLG, and RGQNMLGG. at least 8 contiguous amino acid residues of SEQ ID NO:4, wherein said at least 8 contiguous amino acids include a residue corresponding to Ala at is at least 8 amino acids in length; (ii) said fragment

~~includes an amino acid residue at position 72, numbered relative to of SEQ ID NO:4; and (iii) said amino acid residue at position 72, numbered relative to SEQ ID NO:1, is an arginine residue.~~